Claims 1-7 were pending in the present application prior to the aforementioned amendment. By the above actions, claim 1 has been canceled without prejudice, claims 2-5 are amended, and claim 8 is added to more clearly recite protection to which Applicant is already entitled. Applicant submits that no issue of new matter is set forth by this amendment. Accordingly, claims 2-8 are currently pending in the subject application, and are believed to be in condition for allowance at least for the reasons advanced hereinbelow.

Please note that Applicant respectfully requests consideration of the Information Disclosure Statement submitted January 16, 2001. Although the Examiner forwarded a signed copy of the Form PTO 1449, there was no indication that the references cited therein were fully considered since each citation was not initialed as required by M.P.E.P. 609. Applicant respectfully requests that an initialed copy of the Form PTO 1449 be forwarded to Applicant in the next communication from the Patent Office.

Initially, the Office Action rejects claim 1 under 35 U.S.C. §112, second paragraph as indefinite. By the above amendment, claim 1 is canceled and replaced with new claim 8, thereby rendering this rejection moot. In this regard, Applicant respectfully submits that claim 8 is definite in all respects to 35 U.S.C. §112, second paragraph. Reconsideration and withdrawal of the rejection is earnestly solicited

The Office Action maintains the rejection of claims 1-4 and 6 under 35 U.S.C. §103(a) as unpatentable over U.S. Patent No, 4,051,777 to ***Black*** (hereinafter "***Black***") in view of U.S. Patent No. 3,843,974 to ***Miller et al.*** (hereinafter "***Miller***"), and claims 5 and 7 under 35 U.S.C. §103(a) as unpatentable over the ***Black*** patent in view of U.S. Patent No. 5,019,202 to ***Kawahata et al.*** (hereinafter "***Kawahata***"). Notwithstanding the fact that claim 1 is canceled and replaced with new claim 8, these rejections are respectfully traversed for at least for the reasons solicited hereinbelow.

The claimed invention is directed generally to a stencil printer comprising an ink supply pump including a diaphragm pump having a diaphragm operable between a first position preventing flow of ink therethrough and a second position permitting flow of ink therethrough, and a drive assembly for driving the diaphragm between the first and second positions. In accordance with the claimed invention, the diaphragm is driven by the drive assembly such that a stress applied to the diaphragm is limited to less than 75% of the elastic limit of the diaphragm.

Applicant respectfully contends that the claimed invention imparts non-obvious advantageous features over conventional stencil printers. For example, the present inventors have found that when conventional piston or plunger pumps are used in stencil printers using ink, curing of the ink is produced due to frictional forces arising from the sliding of the piston or plunger pumps. In response to this problem, Applicant proposes in accordance with the claimed invention, the use of a diaphragm pump having the following properties. First, the diaphragm pump includes a diaphragm that is operated such that a stress applied to the diaphragm is limited to less than 75% of the elastic limit of the diaphragm. Secondly, in order to suppress deterioration of the diaphragm and thereby increase its operational life, the diaphragm is composed of fluoro-rubber or natural rubber. Applicant contends that the diaphragm pump, in addition to its mechanical and operational properties, patentably distinguishes the claimed invention over the prior art.

It should be noted that three criteria must be met to establish a *prima facie* case of obviousness. *M.P.E.P.* §2143. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings to achieve the claimed invention. *Id.* Second, there must be a reasonable expectation of success. *In re*

Rhinehart, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976). Third, the prior art must teach or suggest all the claim limitations. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

Applicant respectfully contends that the ***Black*** patent, either alone or in combination with the ***Miller*** and ***Kawahata*** patents, fails to expressly teach or inherently suggest all the claim limitations of the claimed invention necessary to support a *prima facie* case of obviousness. For example, the Office Action maintains that the ***Black*** patent discloses "a stencil printer comprising an ink supply pump in the form of a diaphragm pump." The Office Action, however, concedes that ***Black*** does not teach the use of silicon rubber. Consequently, the ***Miller*** patent is provided in order to modify the noted deficiencies in the ***Black*** patent since ***Miller*** allegedly discloses "a diaphragm pump which is made of silicon rubber."

Assuming, arguendo, that the proposed ***Black*** modification discloses the aforementioned features, Applicant respectfully contends that the rejection is improper. More particularly, Applicant respectfully contends that there is a lack of an express finding in the Office Action that the ***Black*** patent, either alone or in combination with the ***Miller et al.*** and ***Kawahata et al.*** patents, expressly teaches or inherently suggests a diaphragm pump including a diaphragm which is driven by a drive assembly such that a stress applied to the diaphragm is limited to less than 75% of the elastic limit of the diaphragm. It is this structural and functional relationship between the diaphragm and the drive assembly which clearly patentably distinguishes the claimed invention over the prior art.

Although it appears that the Office Action fails to afford patentable weight to this limitation because it is in narrative in form, Applicant respectfully submits that there is adequate positively-recited structure such that the claims are definite for what they fairly

convey to a person of ordinary skill in the art in the context in which it is used. All words in a claim must be considered in judging the patentability of a claim against the prior art. *In re Wilson*, 424 F.2d 1382, 165 USPQ 494 (CCPA 1970). "There is nothing inherently wrong with defining some part of the invention in functional terms." M.P.E.P. 2173.05(g) (Feb. 2000). "A functional limitation must be evaluated and considered, just like any other limitation of the claim, for what it fairly conveys to a person of ordinary skill in the pertinent art and the context to which it is used." *Id.* "Functional language does not, in and of itself, render a claim improper." *In re Swineherd*, 439 Fd. 210, 169 USP 266. Accordingly, Applicant respectfully requests the Examiner afford full patentable weight to each and every claimed feature set forth in the pending claims.

Should the Examiner maintain his position with respect to the aforementioned rejections, Applicant respectfully contends further that the rejection is improper inasmuch as the secondary ***Miller*** patent is non-analogous to the teachings set forth in the claimed invention. It is further noted that a determination that a prior art reference is from non-analogous art is twofold. A prior art reference is analogous if the reference is in the field of applicant's endeavor or, if not, the reference is reasonably pertinent to the particular problem with which the inventor is concerned. *In re Oetiker*, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992). A reference is reasonably pertinent if, even though it is in a different field of endeavor from that of the claimed invention, it is no less one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem. *In re Wang*, 993 F.2d 858 (Fed. Cir. 1993).

Applicant respectfully contends that the ***Miller*** patent fails the first nexus of the test for determining analogous art in that it is not in the field of Applicant's endeavor. For instance, the diaphragm pump disclosed in the claimed invention has applicability in a stencil printer. In contrast thereto, the ***Miller*** patent discloses a diaphragm pump that has

applicability in a circulatory assist device. (Col. 1, lines 1 et seq.). This is further supported by the fact that claimed invention and the ***Miller*** device are classified in different classes within the PTO's patent classification system.

The ***Miller*** patent also fails the second nexus of the test for determining analogous art in that it is not reasonably pertinent to the particular problem with which Applicant is concerned. For instance, the ***Miller*** patent discloses a diaphragm pump that has applicability in a circulatory assist device for pumping a fluid medium such as human tissue, which has a dissimilar viscosity and density than the ink which is used in the claimed invention. (Col. 1, lines 1 et seq.).

On the other hand, the diaphragm pump of the claimed invention has applicability in a stencil printer for displacing a fluid medium such as ink. The use of a diaphragm pump in accordance with the claimed invention suppresses curing of the ink that occur due to frictional forces arising from the sliding of conventional piston or plunger pumps. In this regard, the diaphragm pump of the claimed invention is exposed to different operating conditions, i.e., temperature, pressure, etc. than the diaphragm pump disclosed in the ***Miller*** patent.

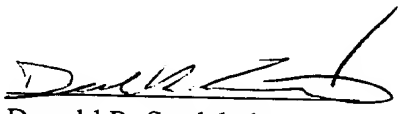
Accordingly, the ***Miller*** patent fails to expressly disclose or implicitly suggests that its diaphragm pump has applicability in a fluid environment such as that which is claimed in the claimed invention. In spite of the divergent conditions in which the diaphragm of the claimed invention must operate, the type of material in which the diaphragm is composed allows the diaphragm to operate virtually flawlessly. In other words, there is no suggestion in the ***Miller*** patent that the diaphragm pump may be modified in order to function in an environment such as that which is exhibited in a screen printer. Accordingly, the teachings of the ***Miller*** patent would not commend itself to one of ordinary skill in the art of stencil printing inasmuch as the diaphragm pump disclosed

therein is intended to operate under a totally different working environment that that which is faced in a stencil printer.

Notwithstanding the aforementioned argument, by the above actions, claim 4 is amended to recite that the diaphragm is composed of fluoro-rubber or natural rubber. Although it appears that the ***Miller*** patent discloses a diaphragm pump composed of silicone rubber, there is no teaching or suggestion that the diaphragm pump may be composed of alternative materials such as fluoro-rubber or natural rubber. Accordingly, reconsideration and withdrawal of the rejection is respectfully solicited.

Accordingly, since the proposed ***Black*** modifications fail to expressly teach or inherently describe each and every claim limitation necessary to support a finding of *prima facie* obviousness under §103, it is respectfully requested that the rejection be reconsidered and withdrawn. If the Examiner believes further discussions with Applicants' representative would be beneficial in this case, he is invited to contact the undersigned.

Respectfully submitted,



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Marked-Up Version of Amended Claims

2. (Amended) A stencil printer as defined in Claim [1 in which] 8 wherein the drive assembly is configured to stop in a position where the stress applied to the diaphragm of the diaphragm pump is not larger than 75% of the elastic limit of the diaphragm.

3. (Amended) A stencil printer as defined in [claim 1 in which] Claim 8 wherein the drive assembly is configured such that the maximum stress applied to the diaphragm during operation of the diaphragm pump does not exceed 75% of the elastic limit of the diaphragm.

4. (Amended) A stencil printer as defined in Claim [1 in which] 8 wherein said [the] diaphragm is composed of [a material whose swelling ratio to the ink is not larger than 1.05] fluoro-rubber or natural rubber.

5. (Amended) A stencil printer as defined in Claim [1 in which] 8 wherein said ink comprises an ultraviolet ray curing ink [is used].